Sample Year 2001 CALFED Water Management Scenario
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Draft

Methodology

At this point, the Coordination Team (CT) will be focusing on the physical manipulation of the system. Therefore, a scenario will consist of:

- A list of assets
- A list of operational constraints to those assets.
- A description of how those assets are to be shared.

A change in any one of these lists creates a new scenario. In general, there is no reason for the CT to fight over the creation of the best scenario – we should be able to accommodate numerous scenarios, limited primarily by our ability to analyze them within the allowed time. If we are clever, our new and streamlined simulation process should be able to look at far more scenarios than we have looked at to date.

I have sketched out a beginning of Stage 1 scenario below (e.g., year 2000 – 2002). There are numerous points where others might have made other decisions. I have tried to flag some of the contentious branch points. I have mentioned some other assets that may or may not be gameable, but should be considered part of the scenario.

Mission

The CT needs to develop some sort of mission statement for the EWA. Up to now, we have talked only in the vaguest terms about what the EWA will do and what it will prioritize. I would put the following within the EWA's mission (prioritization is more difficult):

- ESA species
- Upstream flow and temperature needs (including ERP flows)
- Delta ecosystem flow and diversion optimization
- CVPIA flow goals (anadromous fish doubling)
- Enhancement of commercial and recreational fisheries
- Adaptive management experimentation
- No net degradation of water quality
- Sharing of assets with water users to increase user supplies on a "no harm" basis to EWA

Scenario Alpha (we are running out of names!)

I will attempt to have an "end of Stage 1" scenario ready for tomorrow's meeting. It will merely be a continuation in time of Scenario Alpha. I based the scenario on the following considerations:

- We will need to use practically every feasible tool to have a chance of satisfying different sides.
- The EWA needs wet water in dry years upstream of the Delta.
- The EWA needs to be able to effect major reductions in winter and spring export pumping during wet years.
- The exporters need additional dry year support, compared to previous games.
- We need to bring water quality tools explicitly into the analysis.
- We must simulate the management of b(2) water in our analysis.

On this basis, I emphasized sharing formulas that gave the EWA upstream dry year water and export reduction capability in wet years, while improving dry year deliveries to the water users. I also looked at relaxation of one additional standard – the Delta agricultural salinity standards – coupled to measures to make such a relaxation acceptable to the Delta farmers, CCWD, and the environment. See what you think.

I am not sure that I used all the tools or the correct nomenclature. **We will need to refine the definition of these various assets based upon the ongoing asset definition work by the CT.**

I do have a concern about loading down our gaming with lots of fairly minor tools. If we can get the big picture with a smaller number of tools, I would recommend we start there.

We can fix problems at the CT meeting.

Analysis

Very roughly, I think that I was able to simultaneously improve, compared to earlier gaming:

- Dry year export deliveries by several hundred thousand acre-feet (while reducing wet year deliveries to a lesser degree)
- Dry year upstream eco water by about 100 kaf.
- Wet year export reduction rights to the EWA of several hundred thousand acre-feet.

Scenario Alpha October 6, 1999 Draft

Baseline for purposes of modeling = Accord + Trinity + COE (as defined herein) with some relaxation of Delta ag salinity standards (as defined herein). VAMP the responsibility of EWA/b(2). b(2) not modeled, but assessed during gaming.

Asset/ Measure	Operational Constraints	EWA/ Projects Relationship	Discussion
Kern Water Purchase	<= 90 kaf in wet years 100 kaf dry years (for first 2 years of drought).	Controlled by EWA	.Primary use of dry year options to backstop more aggressive wet year operations – i.e., collateral.
Other Market Purchases of Water	Needs definition. I would propose refined supply curves (a volume increases, unit price increases) for each basin.	EWA	
Semitropic Storage Capacity	Sublease 100 kaf usable storage 20/10 kaf/month in/out	EWA controlled storage. Projects may borrow capacity and stored water at cost on a "no harm" basis	
Vidler WCo gw storage and purchase	49 kaf leased space. 6.3 kaf water purchase	EWA controls	Overlap w/ Semitropic?
MWD Source Shifting	60 kaf (for period of 5 – 10 years only)	EWA controls	
Lake Almanor releases	100 kaf per year extra March – May flows on Feather.	Projects in above normal years etc. EWA in below normal years, etc. However, EWA required to loan any Almanor water diverted in Delta and loan to exporters. Repayment during future wet year +50%.*	Effects on Almanor Lake Levels.
Shasta Flashboards	50 kaf capacity	CVP	Improves ability to meet carryover targets.
E/I Variances		EWA	
b(2) water	Operate in coordination with EWA. For purposes of analysis, treat as if part of EWA	EWA	Effects on federal contractors depend on particular use choices. For this scenario, assume b(2) is as defined by DOI. Can develop related scenario in which b(2) is as recommended by water users.
b (2) dry year/ wet year exchange. This may be seen as a form of storage.	200 kaf dry/ below normal year to federal exporters. 300 kaf payback during above normal/ wetter years.	In dry years, DOI releases b(2) water from upstream for instream benefits, then exports and loans the water to export agriculture. In wet years, export ag pays back loan + 50%.	See end note.

Asset/ Measure	Operational Constraints	EWA/ Projects Relationship	Discussion
Expanded Banks Pumping	COE Banks limit raised from 6.6 to 8.5 kcfs. July – September 6.6 + 1/3 SJR November - March	Projects control September – February EWA controls March – August [N.B., this distribution assumes that 8.5 not available all year. Can we do better?	EWA is able to use summer pumping for payback, if spring cutbacks were needed. Projects can use Septemberfor early filling of San Luis. EWA control in March due to high bio sensitivity.
Efficiency Purchase	CALFED cofunds 10 kaf supply of efficiency from EBMUD via high intensity ULFT program.. Custody of water taken in Pardee Reservoir. 10 year contract. Then, water reverts to EBMUD	EWA Controls.	Target on EBMUD due to: (1) reluctance of EBMUD to implement ULFT program; (2) ability of EBMUD to sweeten CCWD supply (see below).
Delta Crop Shift Program	During some or all years, program to shift crops in Western/ Central Delta into winter crops, salt tolerant crops, or fallowing.	Projects benefit from reduced ET during balanced conditions.	Also linked to relaxation of Delta ag salinity requirements, esp in dry years (see below).
Delta agricultural salinity standards relaxation	During dry or all years, relax Delta agricultural salinity standards. Reduces outflow needs. Allows Projects to hold water upstream or increase exports.	Projects	Impact on salinity of Delta exports. CCWD impacts mitigated by EBMUD intertie (see below). Other exporters will operate around salinity or accept impacts.
EBMUD/ CCWD Intertie and wheeling.	Construct intertie between EBMUD and CCWD. Deliver EBMUD water to CCWD during years in which CCWD salinity impacted by ag salinity std relaxation		EBMUD is not impacted, since water delivered to CCWD generated through efficiency.
Access to unused Delta pumping capacity	Includes JPOD and EWA access to Banks and Tracy	JPOD normally has priority above EWA. However, EWA may veto use of JPOD to deliver surplus water. CVP may not intrude into EWA share of Banks without permission of EWA.	Remember that EWA retains priority in Banks for pumping above 6.6 kcfs from March – September
Access to unused CVP/ SWP storage capacity	San Luis + upstream reservoirs + other reservoirs.	EWA water is first to spill as Project storage fills.	
Access to unused non Project storage capacity	Assume Yuba and SJR Tribs. Purchase right to use storage on a "no harm" basis.	EWA	Can access by backing water.

Asset/ Measure	Operational Constraints	EWA/ Projects Relationship	Discussion
Access to unused stored water	Loans of stored water between the Projects and EWA. Limited to loans with probability of payback before need above 95%. Penalty for non payback $1,000/af.		Some loans might be carried for a year or more without impact.
EWA Funding	$60 million/ year		Increased amount to account for incorporation of ERP Purchase goals into EWA mission. B(2) water paid out of separate Federal fund.
Coordinated Delta Island Leaching	During March Delta leaching season, coordinate fish protection pumping reduction with electricity subsidy program. May reduce loading of TOC into export system.	Cost of pumping reductions, electricity subsidy would be shared between EWA and Projects.	Needs particle tracking study. Idea is to narrow leaching window to period during which exports reduced already for fish protection.
DMC/ CA Aq. Intertie	COE/ SWRCB limits on exports apply	Projects	
Manage discharge from Delta islands	Needs definition		May not need to be included in gaming.
Manage salinity and selenium inputs	Needs definition		If proposal is for coordinating releases with high flow periods, could game
Delta Cross Channel	Needs definition		May not need to game.
Control Algal Growth in CCF			
Reservoir Reoperation	Coordinate/ optimize operation of reservoirs.		EWA right to use and borrow storage may lead to more optimal regimes without need for explicit analysis.
CVPIA: Shifting refuge supplies	? Needs discussion about feasibility for early Stage 1.		

* The 50% increase is designed, both to account for the increased economic value of dry year water, and to roughly compensate the EWA for additional pumping that may occur in wet years. Here is what could happen. The EWA lends 100 kaf in a dry year. The Projects then give the EWA 150 kaf of free export pumping reductions during a future wet year. The fact that export pumping in the spring may drop by 150 kaf does not mean, however, that total project diversions will drop by 150 kaf. In many years, the Projects will make full deliveries and still be able to fill San Luis during the next winter. If so, then the projects will lose little or none of the 150 kaf. The 150 kaf number is unlikely to be the correct number. Additional modeling will be needed to determine a fair comprimise point. The same is true for other instances where dry year EWA water is lent to the Projects.